Day 2 - Hardware and Software Platform

Overview

In this class, we will learn about the hardware and software platforms that can be used for building IoT devices.

We will use ESP8266-based development boards, which are very cheap and readily available. For programming, we will use a variant of Python called Micropython. I chose Python because it is a very versatile language and one of the most important languages that every person in the tech world should know.

For the initial few sessions, we will practice hardware connection and programming on a Simulator (https://wokwi.com/). For starters, simulators are the best tools as you do not need to get into the hassle of connecting wires and getting the hardware to work and still get a full feel of the actual development.

Session Flow

Microcontrollers v/s Microprocessors

In this part, we will understand the fundamental difference between the MCUs and MPUs. We will also discuss the applications of them.

About ESP8266 boards

In this part, we will understand some important features of ESP8266-based development boards.

About Micropython

In this part, we will understand the use of MicroPython and see how it is different from the standard Python language.

Flashing MicroPython into ESP8266

In this part, we will learn the steps that we need to follow to get the Python REPL running on the ESP8266 module. This will allow us to run the Python scripts directly on the development board.

Basics of Python Programming

Since some of us might be very new to Python programming, we will take some time and understand a few important aspects of Python language.

Note: It is suggested that everyone should refer to the [Getting Started with Python](#) and come to the training with a basic understanding of the Python language.

Getting started with Wokwi

In this section, we will learn about a popular hardware simulator wokwi.com. We will learn about the setup, write a micro Python program, and run the code on a simulated hardware device.

Resources

1. ESP8266 [datasheet](#)
2. [Micropython on esp8266](#)
3. [Getting Started with Python](#)
4. [Hardware simulator](#)
5. IDE to be used for actual hardware
   a. [Thonny](#)
   b. [Mu editor](#)